**CLAIMS**

What is claimed as being new and desired to be protected by LETTERS PATENT of the United States is as follows:

1. A remote temperature monitoring apparatus, comprising:

a base-located energizing wave transmission/communication wave reception unit located at a base location, that transmits an energizing wave and that receives temperature-dependent communication wave emissions, and

a remotely-located, energizing-wave-powered, temperature-dependent communication wave emission unit, located a remote location from the base location, for monitoring temperature at the remote location and for transmitting a temperature-dependent communication wave emission, wherein said remotely-located, energizing-wave-powered, temperature-dependent communication wave emission unit includes material having a temperature-dependent communication wave emission characteristic,

wherein said temperature-dependent communication wave emission is received by said base-located energizing wave transmission/communication wave reception unit which provides an alarm signal when the monitored temperature at the remote location is equal to or is beyond a predetermined alarm temperature.

2. The apparatus of claim 1 wherein said base-located energizing wave transmission/communication wave reception unit provides said alarm signal at said base location.

3. The apparatus of claim 1 wherein:

said material having a temperature-dependent communication wave emission characteristic has a range of temperature-dependent resonant frequencies corresponding to a range of monitored temperatures,

said base-located energizing wave transmission/communication wave reception unit transits a probing energizing wave having a probing frequency,

said remotely-located, energizing-wave-powered, temperature-dependent communication wave emission unit receives said probing energizing wave having said probing frequency, and, when a temperature-dependent resonant frequency of said material having a temperature-dependent communication wave emission characteristic substantially matches said probing frequency, said material having a temperature-dependent communication wave emission characteristic emits a temperature-dependent resonant frequency which corresponds to a specific monitored temperature in said range of monitored temperatures, and

said base-located energizing wave transmission/communication wave reception unit receives said temperature-dependent resonant frequency emitted from said

remotely-located, energizing-wave-powered, temperature-dependent communication wave emission unit, which corresponds to said specific monitored temperature, and compares said specific monitored temperature to said predetermined alarm temperature.

4. The apparatus of claim 3 wherein:

said base-located energizing wave transmission/communication wave reception unit transmits a series of probing energizing waves having a series of probing frequencies,

said remotely-located, energizing-wave-powered, temperature-dependent communication wave emission unit receives said series of probing energizing waves having said series of probing frequencies, and, when a temperature-dependent resonant frequency of said material having a temperature-dependent communication wave emission characteristic substantially matches a specific probing frequency of said series of probing frequencies, said material having a temperature-dependent communication wave emission characteristic emits a temperature-dependent resonant frequency which corresponds to a specific monitored temperature in said range of monitored temperatures, and

said base-located energizing wave transmission/communication wave reception unit receives said temperature-dependent resonant frequency emitted from said

remotely-located, energizing-wave-powered, temperature-dependent communication wave emission unit, which corresponds to said specific monitored temperature, and compares said specific monitored temperature to said predetermined alarm temperature.

5. The apparatus of claim 4 wherein:

probing frequencies in said series of probing frequencies are separated from one another by a probing frequency interval, and

said probing frequency interval is proportional to the ratio of the range of resonant frequencies to the range of monitored temperatures of said material having a temperature-dependent communication wave emission characteristic.

6. The apparatus of claim 1 wherein:

said remotely-located, energizing-wave-powered, temperature-dependent communication wave emission unit is located at a vessel being heated by a heating device and is used for monitoring the temperature of the vessel being heated, and

said base-located energizing wave transmission/communication wave reception unit is located at a location away from the vessel being heated and provides an alarm signal when the monitored temperature of the vessel being heated is equal to or is beyond a predetermined alarm temperature.

7. The apparatus of claim 1 wherein said remotely-located, energizing-wave-powered, temperature-dependent communication wave emission unit is in a pill-like form and is used for monitoring the core temperature of the patient and provides an alarm signal when the monitored core temperature of the patient is equal to or is beyond a predetermined alarm temperature.

8. The apparatus of claim 1 wherein:

said remotely-located, energizing-wave-powered, temperature-dependent communication wave emission unit is located inside a patient undergoing an operation and is used for monitoring the temperature of lavage fluids used in the operation and pooled in a body cavity, and

said base-located energizing wave transmission/communication wave reception unit is located outside the patient and provides an alarm signal when the monitored temperature of the lavage fluids used in the operation and pooled in a body cavity is equal to or is beyond a predetermined alarm temperature.

9. The apparatus of claim 1 wherein:

said remotely-located, energizing-wave-powered, temperature-dependent communication wave emission unit is located inside a cooling device and is used for monitoring the temperature inside the cooling device, and

said base-located energizing wave transmission/communication wave reception unit is located outside the cooling device and provides an alarm signal when the monitored temperature inside the cooling device is equal to or is beyond a predetermined alarm temperature.

10. The apparatus of claim 9 wherein the cooling device is a slush bag for holding preserved organs.

11. The apparatus of claim 1 wherein:

said remotely-located, energizing-wave-powered, temperature-dependent communication wave emission unit is located at an automotive component outside a passenger compartment and is used for monitoring the temperature of the automotive component, and

said base-located energizing wave transmission/communication wave reception unit is located inside the passenger compartment and provides an alarm signal when the monitored temperature of the automotive component outside the passenger compartment is equal to or is beyond a predetermined alarm temperature.

12. The apparatus of claim 1 wherein:

said remotely-located, energizing-wave-powered, temperature-dependent communication wave emission unit is located at a brake component, and

said base-located energizing wave transmission/communication wave reception unit provides an alarm signal when the monitored temperature of the brake component is equal to or is beyond a predetermined alarm temperature.

13. The apparatus of claim 1 wherein:

said remotely-located, energizing-wave-powered, temperature-dependent communication wave emission unit is located at a catalytic converter, and

said base-located energizing wave transmission/communication wave reception unit provides an alarm signal when the monitored temperature of the catalytic converter is equal to or is beyond a predetermined alarm temperature.

14. The apparatus of claim 1 wherein:

said remotely-located, energizing-wave-powered, temperature-dependent communication wave emission unit is located at an aircraft component outside a cockpit and is used for monitoring the temperature of the aircraft component, and

said base-located energizing wave transmission/communication wave reception unit is located inside the cockpit and provides an alarm signal when the monitored

temperature of the aircraft component outside the cockpit is equal to or is beyond a predetermined alarm temperature.

15. The apparatus of claim 1 wherein:

said remotely-located, energizing-wave-powered, temperature-dependent communication wave emission unit is located at an engine tailpipe, and

said base-located energizing wave transmission/communication wave reception unit provides an alarm signal when the monitored temperature of the an engine tailpipe is equal to or is beyond a predetermined alarm temperature.

16. The apparatus of claim 1 wherein said energizing wave and said temperature-dependent communication wave emission are electromagnetic waves.

17. The apparatus of claim 1 wherein said energizing wave and said temperature-dependent communication wave emission are radio frequency electromagnetic waves.

18. The apparatus of claim 1 wherein said remotely-located, energizing-wave-powered, temperature-dependent communication wave emission unit includes a resonating wave emitter.

19. The apparatus of claim 1 wherein:

base-located energizing wave transmission/communication wave reception unit includes a reader/interrogator, and

said remotely-located, energizing-wave-powered, temperature-dependent communication wave emission unit includes a tag/transponder which includes said material having a temperature-dependent communication wave emission characteristic.

20. The apparatus of claim 19 wherein:

said reader/interrogator includes a transmitter portion and a receiver portion which respectively transmits and receives communication wave emissions in a frequency range having a predetermined nominal wave frequency, and

said material having a temperature-dependent communication wave emission characteristic in said tag/transponder includes a receiver/transmitter which respectively receives and transmits communication wave emissions in a frequency range including said predetermined nominal wave frequency, wherein said communication wave emissions transmitted by said tag/transponder vary in accordance with the temperature of said material having a temperature-dependent communication wave emission characteristic.

21. The apparatus of claim 19 wherein:

said reader/interrogator includes a transmitter portion and a receiver portion which respectively transmits and receives

radio frequency electromagnetic waves in a frequency range having a predetermined nominal radio frequency, and

said material having a temperature-dependent communication wave emission characteristic in said tag/transponder includes a crystal-based receiver/transmitter which respectively receives and transmits radio frequency electromagnetic waves in a frequency range including said predetermined nominal radio frequency, wherein said radio frequency electromagnetic waves transmitted by said tag/transponder vary in accordance with the temperature of said crystal-based receiver/transmitter.

22. The apparatus of claim 19 wherein:

said reader/interrogator includes a transmitter portion and a receiver portion which respectively transmits and receives radio frequency electromagnetic waves in a frequency range having a nominal radio frequency of 27.12 MHz,

said material having a temperature-dependent communication wave emission characteristic in said tag/transponder includes a crystal-based receiver/transmitter which respectively receives and transmits radio frequency electromagnetic waves in a frequency range having a nominal radio frequency of 27.12 MHz, wherein said radio frequency electromagnetic waves transmitted by said tag/transponder vary in

accordance with the temperature of said crystal-based receiver/transmitter.

23. The apparatus of claim 22 wherein said crystal-based receiver/transmitter includes a quartz crystal.

24. The apparatus of claim 22 wherein said crystal-based receiver/transmitter includes an antenna connected to a quartz crystal.

25. The apparatus of claim 1 wherein:

said reader/interrogator includes a transmitter portion and a receiver portion which respectively transmits and receives radio frequency electromagnetic waves in a frequency range having a nominal radio frequency of 13.56 MHz, and

said material having a temperature-dependent communication wave emission characteristic in said tag/transponder includes a crystal-based receiver/transmitter which respectively receives and transmits radio frequency electromagnetic waves in a frequency range having a nominal radio frequency of 13.56 MHz, wherein said radio frequency electromagnetic waves transmitted by said tag/transponder vary in accordance with the temperature of said crystal-based receiver/transmitter.

26. The apparatus of claim 25 wherein said crystal-based receiver/transmitter includes a quartz crystal.

27. The apparatus of claim 25 wherein said crystal-based receiver/transmitter includes an antenna connected to a quartz crystal.

28. A safety apparatus for a heated object, comprising:
a reader/interrogator, remote from the heated object, which emits and receives radio frequency electromagnetic waves in a frequency range having a predetermined nominal radio frequency,

a tag/transponder attached to the heated object, wherein said tag/transponder includes a radio frequency electromagnetic wave emitter which includes a crystal material having a temperature-dependent radio frequency electromagnetic wave emission characteristic in a frequency range having said predetermined nominal radio frequency, wherein said tag/transponder receives radio frequency electromagnetic waves from said reader/interrogator and emits temperature-dependent radio frequency electromagnetic waves from said temperature-dependent radio frequency electromagnetic wave emitter, wherein said temperature-dependent radio frequency electromagnetic waves are indicative of the temperature of the heated object, and wherein said temperature-dependent radio frequency

electromagnetic waves are received by said reader/interrogator, and

an alarm assembly, controlled by said reader/interrogator, for providing an alarm signal when said reader/interrogator receives temperature-dependent radio frequency electromagnetic waves from said tag/transponder which indicate that a predetermined temperature has been reached by the heated object.

29. The apparatus of claim 28 wherein:

the heated object is a cooking vessel, and

said reader/interrogator is located on a cook stove.

30. A safety apparatus for a cook stove, comprising:

a reader/interrogator which emits and receives communication waves,

a tag/transponder attached to a cooking vessel on the cook stove, wherein said tag/transponder includes a temperature-dependent communication wave emitter which includes a material having a temperature-dependent communication wave emission characteristic, wherein said tag/transponder receives communication waves from said reader/interrogator and emits temperature-dependent communication waves from said temperature-dependent communication wave emitter, wherein said temperature-dependent communication waves are indicative of the temperature

of the cooking vessel, and wherein said temperature-dependent communication waves are received by said reader/interrogator, and

an alarm assembly, controlled by said reader/interrogator, for providing an alarm signal when said reader/interrogator receives temperature-dependent communication waves from said tag/transponder which indicate that a predetermined temperature has been reached by the cooking vessel.

31. A crystal-based receiver/transmitter apparatus, comprising:

a crystal, and

an antenna connected to said crystal.

32. The apparatus of claim 31 wherein:

said crystal is a quartz crystal, and

said quartz crystal receives and transmits radio frequency electromagnetic waves in a frequency range having a nominal radio frequency of 27.12 MHz.

33. The apparatus of claim 31 wherein:

said crystal is a quartz crystal, and

said quartz crystal receives and transmits radio frequency electromagnetic waves in a frequency range having a nominal radio frequency of 13.56 MHz.

34. A method for monitoring temperature of a remote location at a base location, comprising the steps of:

emitting base-emitted energizing waves from a transmitter at the base location,

receiving the base-emitted energizing waves at the remote location, whereby the base-emitted energizing waves energize a temperature-dependent transmitter at the remote location, wherein the temperature-dependent transmitter at the remote location includes a quantity of material having a temperature-dependent communication wave emission characteristic,

emitting remote-location-emitted, temperature-dependent communication waves from the temperature-dependent transmitter at the remote location, wherein the remote-location-emitted, temperature-dependent communication waves represent a temperature measurement at the remote location, based upon the temperature of the quantity of material having a temperature-dependent communication wave emission characteristic,

receiving the remote-location-emitted, temperature-dependent communication waves at the base location,

comparing the temperature measurement at the remote location with a predetermined alarm temperature, and

providing an alarm signal if the temperature measurement at the remote location is equal to or greater than the predetermined alarm temperature.